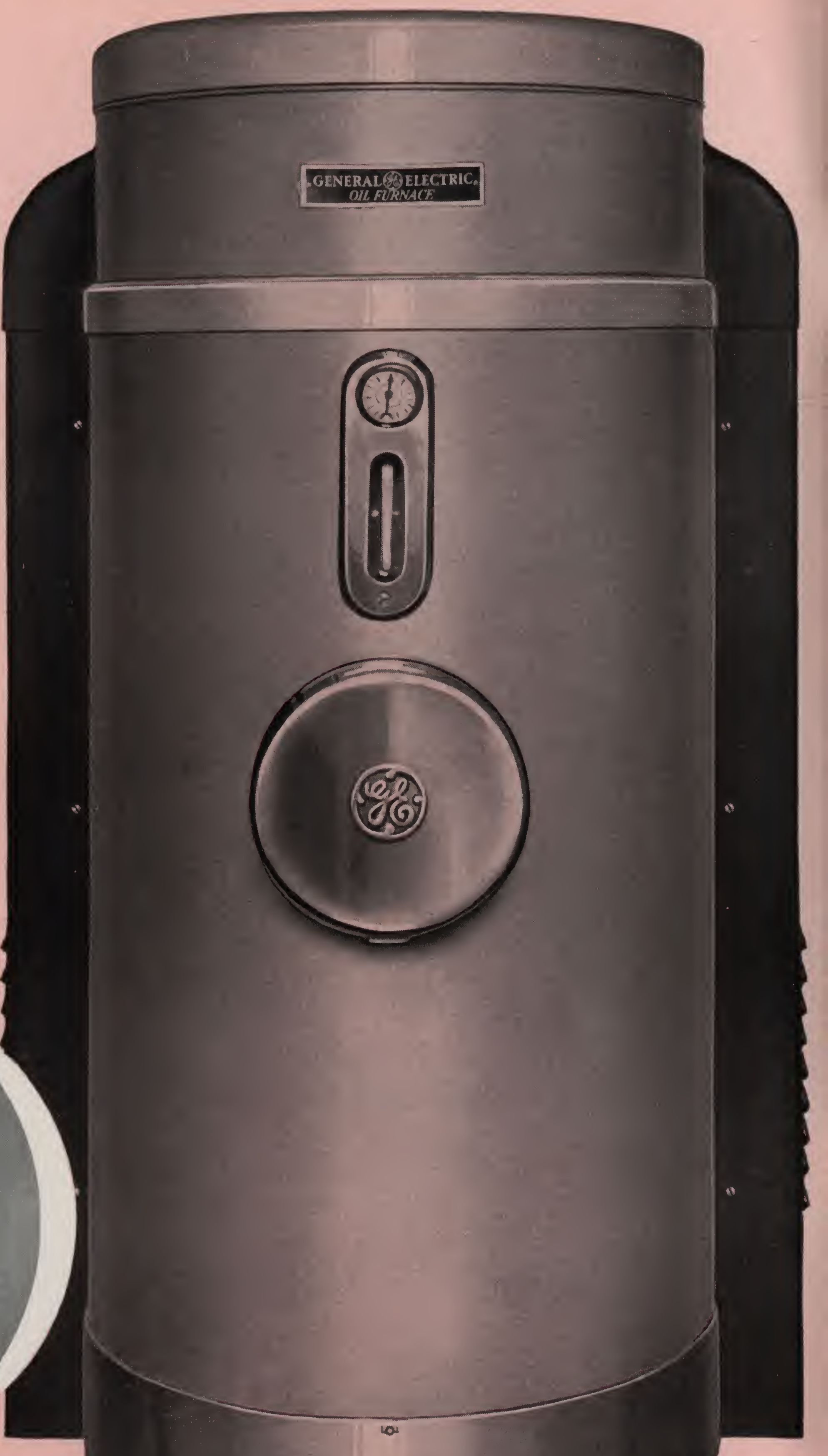
# THE *Inside Story*

## *of the new fuel-saving*

## GENERAL ELECTRIC OIL FURNACE



The Result of Five Years' *engineering research, the revolutionary new G-E Oil Furnace is startlingly different and modern in principle. Now the home owner buys no collection of parts, but one complete unit—burner, boiler, domestic hot water heater, all combined into one—ready to connect to the heating system. The new General Electric Oil Furnace will serve heating systems utilizing hot water, steam, vapor, or with an additional unit—the G-E Air Conditioner—warm air heating.*

# FOR FIVE YEARS

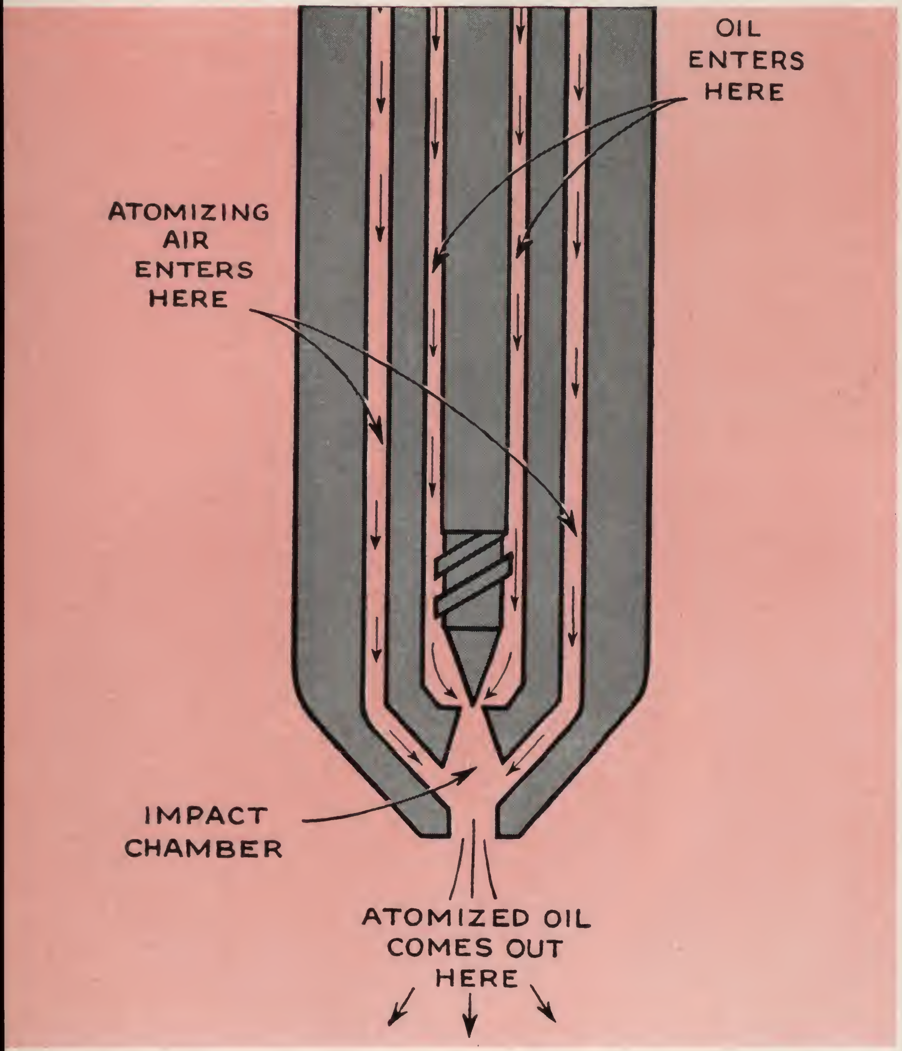
research was carried on in General Electric laboratories to find out how to heat homes with oil, automatically, without *any* work or worry for the home owner, and yet spend actually *less money* for fuel than ever before! That was the problem.

Five years of research . . . Five years of tests . . . Five years of faith . . . And the result? The new General Electric Oil Furnace, not an attachment, but a complete heating plant skilfully engineered and designed to give you low cost service year in and year out, as it has been doing in thousands of homes during two heating seasons.

# *. . . and an amazing new principle of oil atomization was revealed . . .*

Toss a match into a pailful of fuel oil. The oil won't burn. It takes "atomization" . . . a mixture of oil and air . . . to produce the vapor that will burn in furnaces. Here for the first time was discovered a way to change *every drop* of the oil into vapor . . . making oil go further, and heat cost less.

# RESULT? A NEW TYPE OF BURNER



Here's Where the Collision Takes Place—*this enlarged cross-section of the burner nozzle tip shows where oil and air, both under pressure, meet in collision and expand. "Impact-expansion atomization" takes place, shattering the oil into very small particles, turning it into a fog of oil vapor, ready to burn completely, and give up all its heat.*

## lower fuel cost . . . more efficient burning of heavier, cheaper fuel oils

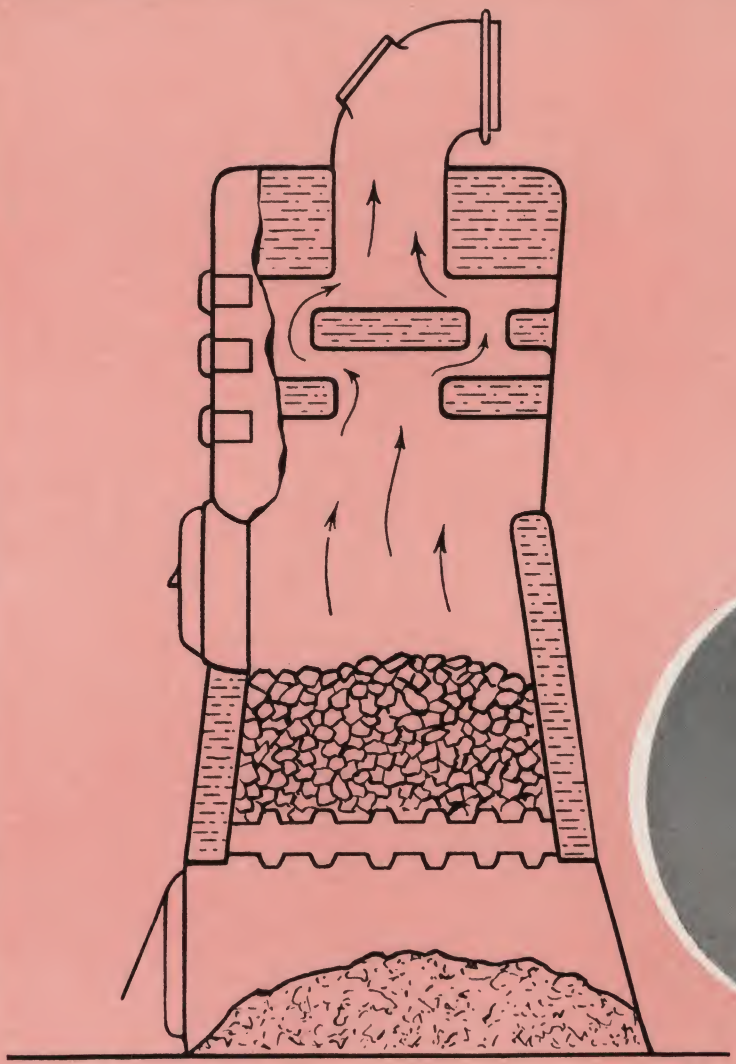
By the principle of "impact-expansion atomization" (a stream of oil and a stream of air in collision *inside* the burner nozzle) the oil is effectively atomized. Every particle of oil is prepared to give up its heat.

## no odors . . . no soot . . . now the oil is completely burned up

When every last drop of oil is turned into vapor and burned . . . there *aren't* any fumes left over. There is no incompletely burned oil to turn into soot.

## quieter . . . new method of combustion prevents noisy operation

Only a small part of the air needed for combustion enters around the jet of atomized oil. The rest of the air enters from the bottom of the combustion chamber and "cushions" the flame. This quiet "progressive combustion" has none of the usual "blow torch" action.



**WHY NOT PUT THE NEW BURNER IN THE OLD FURNACE?**

*The experiment was tried. It didn't succeed. The coal furnace was designed to be most efficient with coal, not oil. With oil heat, the boiler had neither the proper heat transfer surface nor the proper design to cooperate with the new burner and its new control equipment.*

# *then this Question:* HOW SHALL THIS HEAT BE SAVED AND NOT LOST UP THE CHIMNEY?

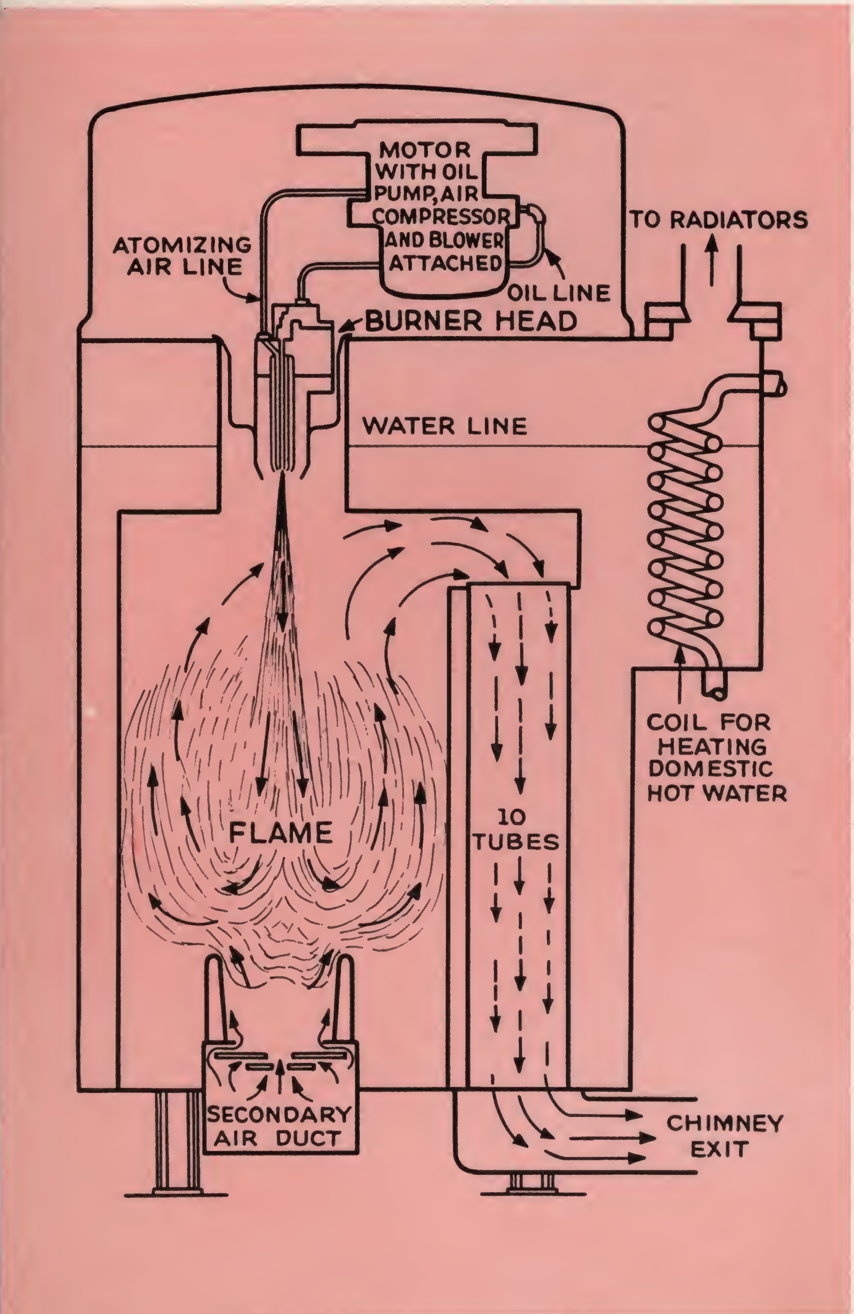
Having developed a new type of atomization and a new type of burner to take all the heat out of oil by burning it completely, G-E engineers faced the question: where should this burner be placed? In the regular coal furnace? Experiments showed why this was uneconomical—a waste of fuel.

## the inefficiency of trying to adapt an old boiler

It is easy to see that with the dozens of different kinds of coal furnaces, each with different sized combustion chambers, there could be no *one* burner that would work best, or even satisfactorily in them all. Why? Because the new oil burner was naturally most efficient when made to burn within one certain shape and size of combustion chamber.

The obvious thing was to build a special boiler. The combustion chamber could then be the exact size needed. The boiler surfaces exposed to this heat could then be of the proper area and arrangement to take a maximum of heat out of the fuel gases. No installation would depend for its efficiency on the type of furnace that happened to be in the home! The entire design and manufacture and therefore the over-all efficiency of boiler and burner could be perfected at the factory. The results of the installation, regardless of size of home or type of heating could thus be forecast in advance.

# *now* AT LAST BURNER AND BOILER *designed* AS ONE EFFICIENT UNIT



The General Electric Oil Furnace is not the result of a compromise. Nothing has been sacrificed to make it work in coal furnaces that were never intended to be efficient with oil for fuel. Here, for the home owner, is an efficient combination of burner, and boiler, and hot water heater, designed to operate efficiently, smoothly, accurately.

## a maximum of heat is actually transferred to the water in the boiler

See how the flame follows the walls of the combustion chamber which is suitably lined with self supported refractory brick. This brick becomes red-hot and promotes thorough combustion of all the oil vapor by maintaining a high temperature within the combustion chamber. Being red-hot, the brick also *radiates* a great amount of heat to the water-backed surfaces. Most of the heat released by the flame is transferred to the boiler-water through the walls of the combustion chamber, before the gases travel on to the secondary heat-transfer tubes. When the flame is shut off, these bricks transfer their stored heat to the water in the boiler, helping to maintain even, constant temperatures.

## why the chimney is at the bottom . . .

The General Electric Oil Furnace is really a "heat trap." When the burner is shut down, the chimney draft does not carry the heat straight up and out the chimney, and so cool off the boiler, lowering its over-all efficiency. The insulated, enclosed boiler and the flue at the bottom practically eliminate this heat loss.

## no exposed parts to collect grease and dirt

In the General Electric Oil Furnace the mechanism is at the top, completely enclosed and sealed to prevent the entrance of dust and dirt, and to prevent any meddling or damage to the mechanism. Where it is properly adjusted at installation, nothing further is necessary.

## domestic hot water supplied all year round

The supplying of hot water, not only in winter time, but all year round at low cost, is one of the definite advantages of the new General Electric Oil Furnace. The coil shown in the drawing is connected with your storage tank.

## all mechanism under suction to carry off odors

No oily vapor, no fumes, can escape from the General Electric Oil Furnace. *The firebox service door is sealed air-tight and bolted in place.* The burner compartment is under a slight vacuum. Any odors are drawn *into* the furnace, not given out.

## variations in chimney draft do not affect burner performance

The G-E Oil Furnace "maintains its own draft." A specially designed pressure blower supplies the air for combustion. Variations in the chimney draft are prevented from affecting the flame, thus keeping heating efficiency constantly high.

## sound filter reduces noise . . .

The quiet operation of this completely enclosed mechanism is further improved by the design of the air passages, which by their arrangement form a sound filter.

## *Here's what happened to fuel bills in 6 typical homes:*

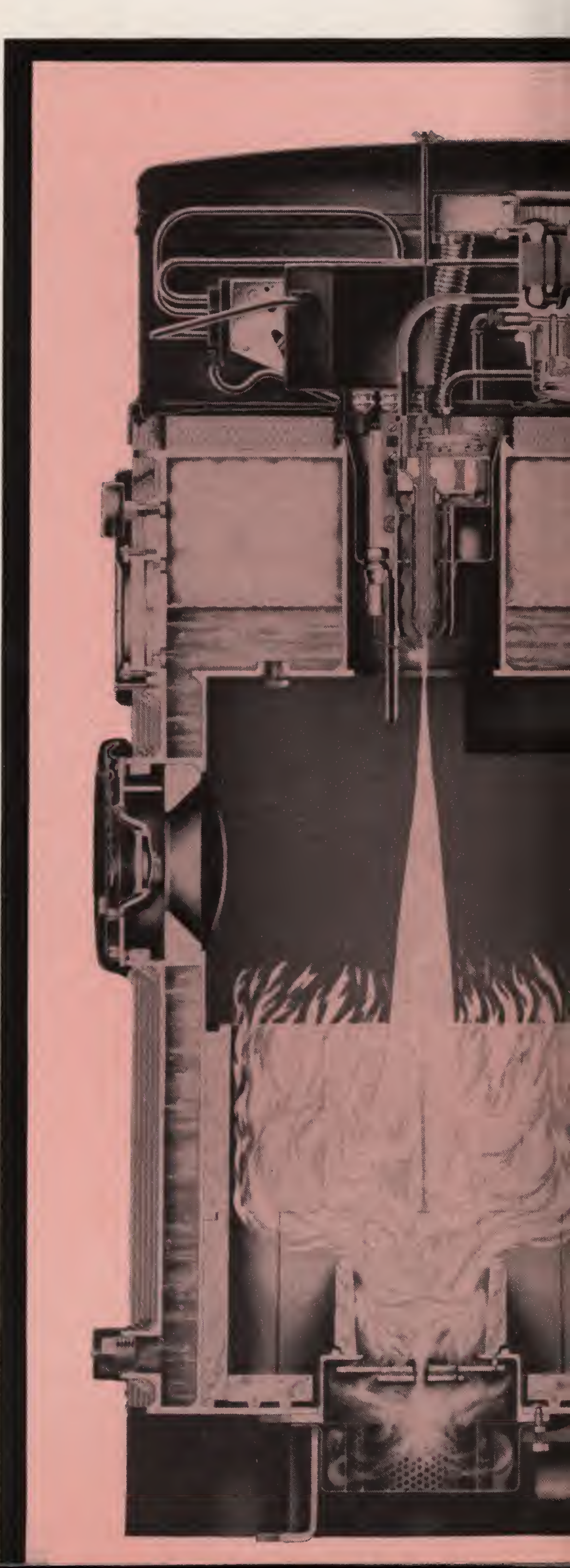
| *Rooms in House* | *Heated Volume of House (Cu. Ft.)* | *Type of Heating System* | *Previous Kind of Fuel Used* | *Cost of Heat and Hot Water with Previous System* | *Average Cost of Heat and Hot Water with G-E Oil Furnace* | PER CENT SAVING |
|---|---|---|---|---|---|---|
| 7 | 11,600 | Vacuum Steam | No. 1 Oil @ 9¢ | $250 | $134 | 46% |
| 7 | 12,800 | Hot Water | Coal | 172 | 115 | 33% |
| 14 | 40,000 | Vacuum Steam | Coal | 555 | 262 | 53% |
| 6 | 11,000 | Vacuum Steam | Coal | 204 | 174 | 14% |
| 11 | 33,000 | Vacuum Steam | Coal | 335 | 210 | 37% |
| 8 | 10,700 | Steam | Coal | 188 | 144 | 23% |

*These are typical cost studies selected at random from a total of 21 installations where actual daily records were kept by recording instruments. Fuel costs, both under previous system, and with the new G-E, have been readjusted on the basis of equally severe seasons, by use of Weather Bureau records. Thus these figures are impartial and accurate.*

*Both figures include the cost of providing domestic hot water. Previous systems were operated with fires banked every night, while the G-E Oil Furnace was intentionally set to maintain an even temperature of not less than 72° F. indoors, 24 hours a day. (Each degree decrease in room temperature means a 3% saving in operating cost with any system.) Six- and eight-room homes above had previously burned a mixture of buckwheat and egg coal, tending to favor previous system.*

# CROSS SECTION SHOWIN

## *of the new*



### NEW EFFICIENT TYPE OF BURNER

By a new principle of "impact-expansion atomization," oil is efficiently atomized before it is ignited . . . Burner orifice 50 times ordinary size prevents clogging . . . The flame burns downward making the most effective use of the space for the flame. Once adjusted, the combustion rate does not have to be changed . . . High pressure blower and combination oil pump and atomizing air compressor mounted on motor shaft—no gears or belts . . .Bearings oiled automatically, under pressure . . . General Electric Industrial Type Motor used.

### ADVANTAGES OF "PROGRESSIVE COMBUSTION"

The combustion air is divided. A small quantity enters around the jet of atomized oil to promote vaporization. The rest of the air enters the bottom of the combustion chamber, forming a "bowl" of air which receives the vaporized oil and mixes intimately with it. Result: a slow, progressive flame much quieter than the usual "blow torch" action. Complete combustion is assured. No soot.

### BOILER COÖRDINATED IN DESIGN

Pressure blower, preventing chimney draft variations from affecting the flame, aids high heating efficiency . . . Completely enclosed boiler and "chimney at the base" design practically eliminate loss of heat up the chimney when burner is shut down . . . Refractory brick which lines the combustion chamber is installed without cementing and is permanent because it is free to expand and contract . . . Boiler of steel plate, arc welded . . . Boiler designed and constructed in accordance with the American Society of Mechanical Engineers' code for low-pressure heating boilers . . . A.S.M.E. code certificate with each boiler.

### CONTROL OF SAFETY DEVICES

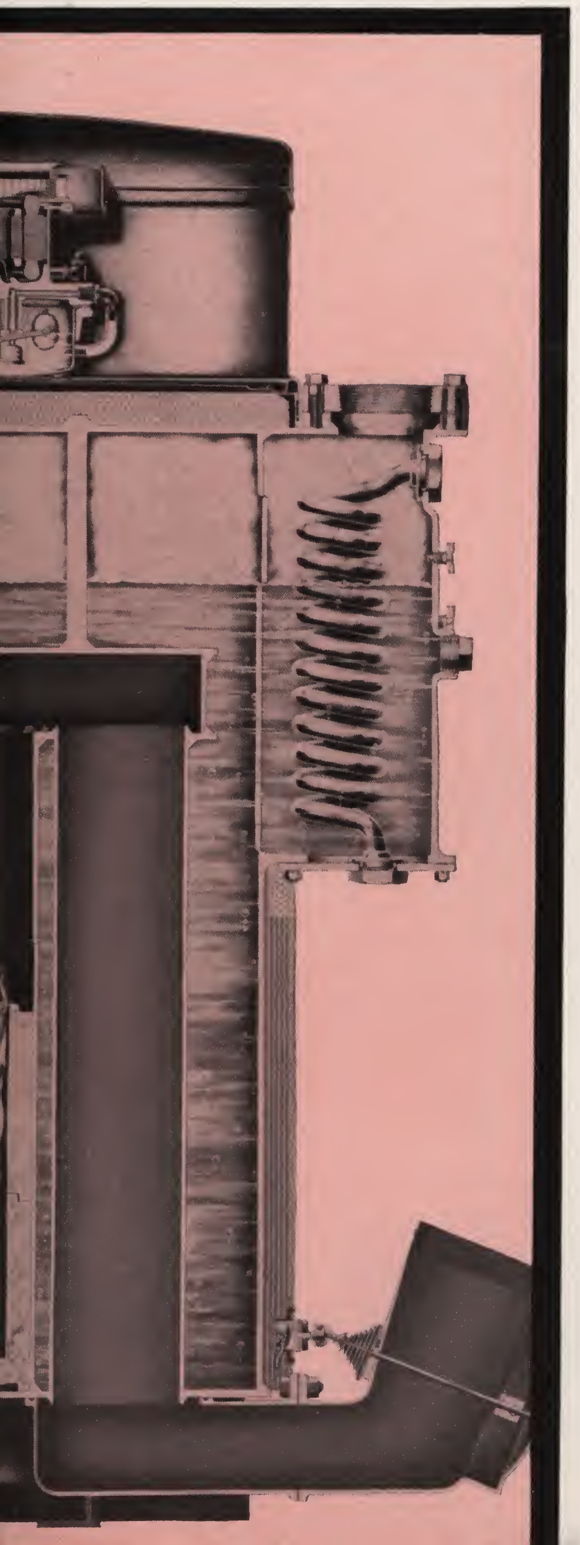
Since General Electric designed the entire heating unit, the automatic controls offer *complete* protection for every operation of the oil furnace . . . All controls are standard equipment, not "extras." Low water cut-off . . . Extra-fast flame detector—if flame is not established in *four seconds* the oil is shut off . . . Oil dribble is eliminated by placing the oil shut-off at the nozzle tip . . . Burner shuts down automatically if oil tank is emptied . . . If current fails, magnetic valve automatically shuts off at burner nozzle and oil pump is stopped at the same time . . . Expansion relief door with electric cut-out.

### ALL ELECTRICAL G-E THERMAL CONTROL

G-E Telechron electric clock mechanism (see illustration page 10) is standard equipment, no extra cost. No winding. Special design maintains accurate adjustment . . . Separate day and night dial adjustments to avoid daily temperature resetting by home owner.

# CONSTRUCTION DETAILS

# *Oil Furnace*



### MATERIALS . . . DESIGN DETAILS

A life test of the mechanism equivalent to many years' actual operation does not show enough wear to affect the operation of any of the parts. High temperature metal parts are of nickel-chromium steel . . . Control contacts are silver . . . Bearings are extra large, under low unit pressure, and automatically lubricated by the fuel itself . . . Type of combustion keeps flame away from nozzle itself. This, plus air cooling of nozzle and ignition electrodes, prevents burned out parts, and frequent replacement.

### NO ADJUSTMENTS FOR YOU TO MAKE

All mechanism is entirely enclosed and sealed to prevent tampering . . . No parts are exposed where they can easily be damaged. To insure entire satisfaction to users, the G-E Oil Furnace will be installed and adjusted only by factory trained experts.

### DOMESTIC HOT WATER THE YEAR ROUND, AT LOW COST

Without extra apparatus, hot water is supplied to your storage tank summer and winter by means of a coil in the boiler. No adjustments needed to change from winter to summer operation . . . Entire operation the year round is automatic.

### HOT WATER, STEAM, VAPOR AND WARM AIR HEATING SYSTEMS

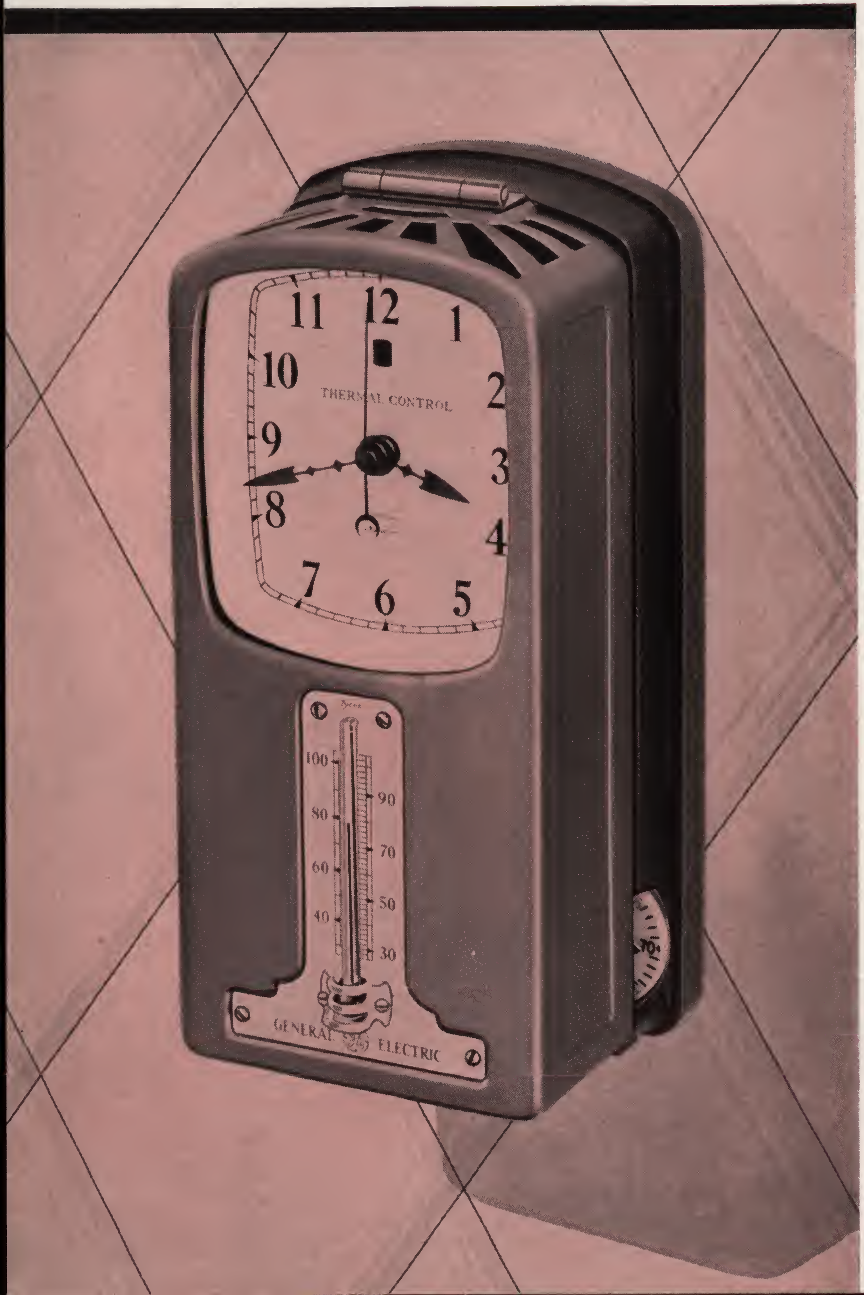
. . . can be operated by the G-E Oil Furnace—two sizes for small or large homes. In the case of warm air heating systems an additional unit, the G-E Air Conditioner, is used for filtering, heating, humidifying and distributing the air.

### COMPLETE G-E DESIGN, MANUFACTURE AND GUARANTEE . . . NO DIVIDED RESPONSIBILITY

The General Electric Oil Furnace is not a collection of parts, but a burner operating on an entirely new principle of combustion, coördinated in design with a suitable new type of boiler . . . all parts made by General Electric. Result—a complete, efficient *unit*, designed to get *more* heat out of low-cost grades of fuel oil . . . Operation is more effective since the entire design is the creation of one responsible manufacturer—General Electric Company.

# THE NEW OIL FURNACE

## *is entirely automatically controlled*



Separate Day and Night Adjustments *on this sensitive G-E Thermal Control give you constant, even room temperatures without winding or daily resetting. No worry for you.*

The only thing the home owner has left to do when he installs the new General Electric Oil Furnace is to decide what temperature the house should be, in daytime and at night, set the G-E Thermal Control and from then on, forget furnace worries.

Every detail of automatic operation is carried on by the following sensitive, dependable electric controls:

Thermal Control (room thermostat)
High water temperature or steam pressure limit
Low water cut-off (for steam installations)
Flame detector
Overload relay
Expansion relief door cut-out
Domestic hot water temperature switch

The electrical control system on the General Electric Oil Furnace takes advantage of the control experience General Electric has accumulated in 40 years of just such research and manufacture. Reliability is assured.

## all-electric G-E Thermal Control . . .

## no winding

It is not necessary for the home owner to reset the G-E Thermal Control night and morning, in order to keep the house at the temperatures wanted. Two dials are provided on the G-E Thermal Control, and settings can be made independently. Once set, there is no need for daily adjustment.

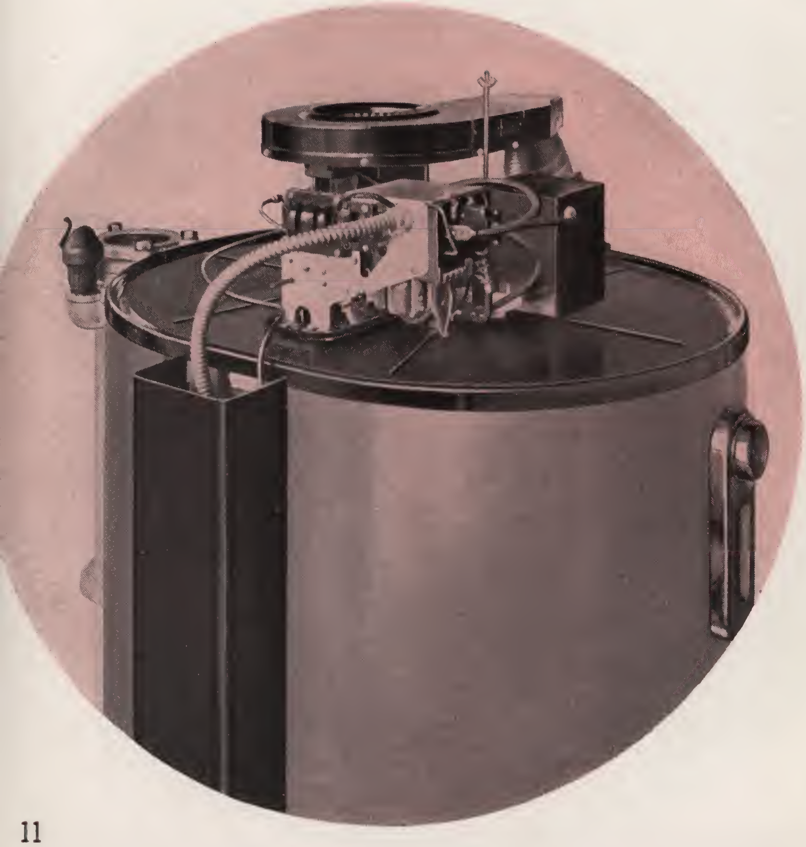
Winding is eliminated by the all-electric Telechron Clock mechanism. No oiling is required.

## why you get heat in minutes . . not hours

By its special design the G-E Thermal Control is amazingly sensitive to temperature changes. The Oil Furnace is therefore set in action at a slight variation from the temperature called for, thus preventing uneven heating due to sluggish action of the room thermostat. Constant even heat is further aided by the furnace design, by which a constant supply of heat is kept *ready for prompt release* to the radiators when the G-E Thermal Control calls for heat. There is no long lapse of time and resulting chilly uncomfortable rooms while you "wait for the heat to come up." You get heat in minutes, not hours.

## burner starts and stops automatically

Suppose the G-E Thermal Control signals that heat is required in the radiators . . . What happens then? The controls in the top of the G-E Oil Furnace cause the following actions: the G-E Telechron timing mechanism on the burner starts the ignition.



Automatic Hot Water Every Day in the Year—*hot water heating is a built-in feature of the new G-E Oil Furnace. Not an "extra." All the hot water you need summer and winter at the turn of a faucet.*

A few seconds later the pressure blower starts, automatically driving any unburned vapor or odors up the chimney. Then the oil valve opens at the burner nozzle tip, permitting atomized oil to flow. Ignition spark (on during all of these operations) immediately ignites the oil vapor.

Vapor is not allowed to collect indefinitely without igniting. If combustion is not established within 4 seconds' time, flow of atomized oil is automatically shut off. One minute is allowed to elapse before cycle of starting operations begins again, igniting the oil vapor. Nothing is left to chance. Is the oil supply exhausted? The furnace will shut down automatically. Is the water too low? The furnace will not start until water is added to the system. These are not extra cost items, but built-in features of the new General Electric Oil Furnace.

## bearings oiled from the fuel oil itself . . . .

Even the last detail of work is automatically done for you! Oiling, a job *anyone* is apt to forget, is automatic on the new G-E Oil Furnace. Fuel oil is filtered and forced into the bearing surfaces under pressure. Bearings won't burn out because of carelessness. Bearing pressure is very light because the bearings are large; thus long life is assured.

NO MORE COAL TO SHOVEL, *no more dusty, dirty basements. To-day, with your new General Electric Oil Furnace, the basement is a new floor in your home, that "extra space" you've wanted. Fix it up. Make it a game room, a place for the children, a place for guests, a place for your hobbies.*

# A NEW PLAYROOM FOR YOU

Do you need more room? The new General Electric Oil Furnace, clean and compact, will give you your whole basement to play in. A new floor for your home.

What will it be? A billiard room? A game room? A place for the children to play? Have the fun of fixing up your basement in bright, cheerful, clean colors. There won't be a speck of dust or soot from the new General Electric Oil Furnace. There can't be. It burns its oil vapor completely. As a matter of fact, the inside of this completely enclosed furnace is under a slight vacuum. Air and odors are actually drawn into it . . . not given out from it.

You'll look back to the days of shoveling coal and wonder how you ever did without this labor saving, economical way to heat a home. You'll wonder how you ever put up with all the dust that filtered through the house, making the basement a place to keep out of, unless you wore your oldest clothes. And even then the basement was only a place to work.

### 10 QUICK REASONS WHY YOU'LL WANT THE NEW G-E OIL FURNACE

1. Automatic Operation . . . no coal to shovel, no clocks to wind, no parts to oil, not any work.
2. Constant, Even Heat . . . accurately controlled by a new type of sensitive G-E Thermal Control.
3. Economy . . . money is saved by getting *more* heat out of *cheaper* grades of fuel oil.
4. Quiet . . . new type of combustion eliminates noise.
5. Cleanliness . . . no soot, no fumes, no vapor, in the house, in the cellar, or carried outdoors by way of the chimney.
6. Longer Life . . . quality, type of materials, and workmanship reduce service and parts replacement to the minimum.
7. Hot Water for Home Use . . . lots of hot water at low cost, not only in winter but every day in the year.
8. Good Looking Compact Design . . . less than one square yard of floor space . . . all-enclosed . . . no oily parts project.
9. Safe . . . General Electric automatic controls make it perfectly safe.
10. Undivided Responsibility . . . one reliable concern makes and guarantees every part of the burner *and* the boiler.

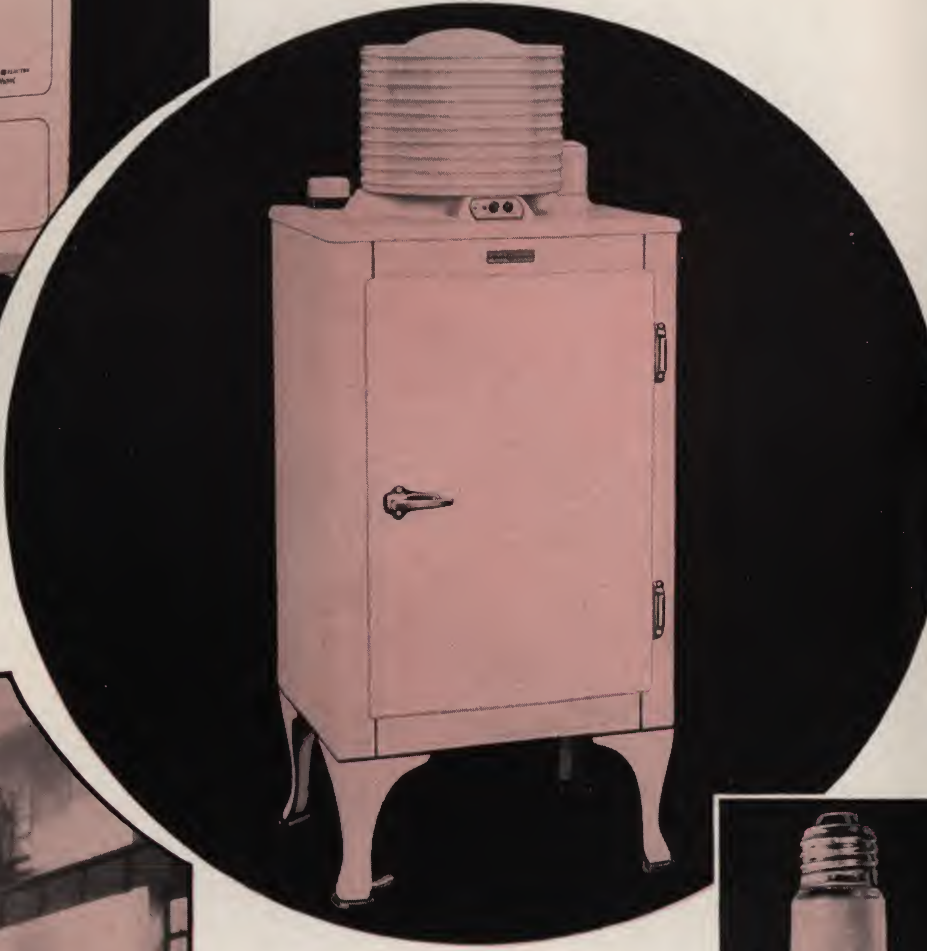
## Handsome compact design . . less than a square yard of floor space

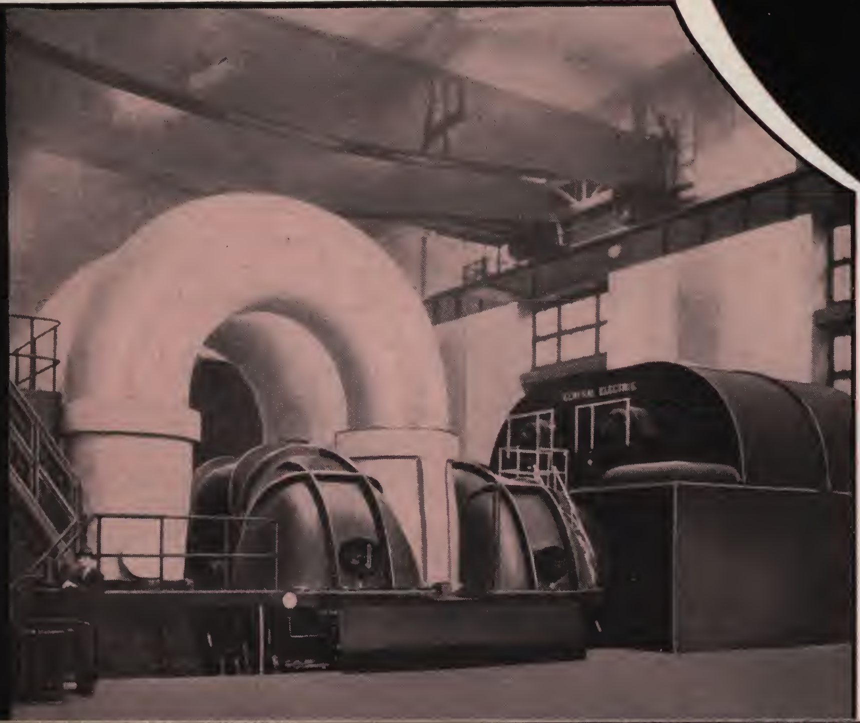
The new General Electric Oil Furnace takes up less than one square yard of floor space. Painted in black and gray, it blends inconspicuously with any color you decide to use in your basement. Or if you have some special color in mind, your paint brush and a can of lacquer or enamel will give you a brand new color scheme in a few hours' time. No special heat-resisting paint needed. No oily parts project into the room. Nothing for you to trip over. Everything is completely enclosed. All the mechanism and the automatic controls are under seal, out of harm's way, beyond the reach of exploring fingers. The graceful, oval and round shapes of the new General Electric Oil Furnace are actually a note of distinction in a room. You'll *want* your guests to see your new General Electric!

# ONE COMPLETE UNIT...ON

*Why has the General Electric Company been able to guarantee the G-E Refrigerator? Only because the G-E engineers created a practically fool-proof freezing mechanism. Equal assurance of long service is yours when you invest in the new G-E Oil Furnace.*

*Timed electric cookery with the G-E Hotpoint Range, quick dishwashing, proper light, correct food preservation, automatic ventilation—these are some of the comforts contributed by the same genius and skill that now brings to your home carefree, automatic oil heating.*





*This monster of mechanical perfection is the largest single-shaft steam turbine in the world. It was designed and engineered by the General Electric Company for the Brooklyn Edison Company. It supplies light and power day and night with the same faithful performance you can expect from the new G-E Oil Furnace in your home. (right) The Mazda lamp is daily bringing comfort and cheer to thousands of homes—a G-E product.*

# E COMPLETE GUARANTEE

## *one responsible manufacturer*

## GENERAL ELECTRIC

PERHAPS you have been impressed throughout this book with the important fact that the G-E Oil Furnace is one complete unit. All its parts have been engineered in the General Electric Laboratories. All parts are designed to work together and give you efficient home heating at lower cost.

It has taken five years and a million dollars to win this perfection. And now that the product, by constant research and rigid tests, has been found worthy, it has been given the guarantee of the world-famous G-E trademark.

You know what this guarantee means on products you use every day—Mazda Lamps, the General Electric Refrigerator, the General Electric Hotpoint Range, and a long list of household and industrial appliances whose operation and control is wholly or in part electrical.

To you, as a home owner who invests in the new G-E Oil Furnace, this same guarantee has a significant advantage—security. You know that the reputation and tested engineering skill of one responsible manufacturer back the satisfactory performance of this new furnace—constant, uninterrupted, trouble-free service year in and year out.

## GENERAL ELECTRIC
## OIL FURNACE

# THE MODERN HOME
# IS
# AIR CONDITIONED

# GENERAL ELECTRIC
# OFFERS
# WINTER, SUMMER AND YEAR ROUND AIR CONDITIONING

## For homes with warm-air ducts

The General Electric Air Conditioning System for Winter uses your present warm-air ducts in the walls. (It includes the G-E Oil Furnace, which supplies the heat. It filters the air, warms it, humidifies it, circulates it throughout the house.) The entire system operates as one unit, automatically by means of the Thermal Control which regulates the temperature, and the humidity control which regulates the humidity.

## For homes with radiators

Now you can have conditioned air in your living quarters all winter at low cost—no expensive alterations to make. Your present radiators supply the heat. The G-E Air Conditioner does the rest. It is fastened to the basement ceiling, out of the way. Simple to install. Filters, humidifies and circulates the air. Does away with dry, stagnant air in your home in winter. Can be used with your present boiler.

## For room air conditioning

The G-E Year Round Air Conditioner warms in winter, cools in summer, controls humidity, filters the air and circulates it the year round. Outdoor air is brought in as desired and outside noises are silenced. Single rooms in homes or offices are comfortable and healthful all year round.

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